PETROLEUM AND NATURAL GAS TENURE IN ALBERTA

September 2016

Alberta Government

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Forward

Alberta Energy is responsible for administering the legislation that governs the ownership and administration of Alberta's petroleum, natural gas, oil sands, coal, metallic and other mineral rights.

This publication covers the administration of the province's petroleum and natural gas rights by Alberta Energy's Tenure Branch. The Oil Sands Branch and the Coal and Mineral Development Branch administer oil sands, coal and other mineral rights, respectively.

The responsibilities of the Tenure Branch, since 1930, have been integral to what is now Alberta Energy. The Tenure Branch is responsible for all aspects of Crown petroleum and natural gas tenure operations and manages over 83,000 active agreements.

The Tenure Branch interacts frequently with industry to ensure that Alberta's tenure legislation, business rules and policies evolve with the changing needs of government and industry.

This publication describes the development of the current system used by the Government of Alberta under which the private sector acquires tenure to Crown petroleum and natural gas rights. It is written for petroleum and natural gas administrators, academic institutions and for anyone interested in the principles and policies under which Alberta Energy interacts with industry. It should be read in the context of the *Mines and Minerals Act*, Petroleum and Natural Gas Tenure Regulation and other associated regulations, and the Information Letters and Bulletins published by Alberta Energy. The *Mines and Minerals Act* and the associated regulations remain the authority for any administrative and regulatory procedure. The information contained in this publication is of an explanatory nature, and is intended to provide an overview of Alberta's petroleum and natural gas tenure system. It covers the period from 1930, when the province assumed control of its natural resources, until 2016.

In 1978, Alberta adopted the metric system of measurement for all administrative purposes. Metric units are used throughout this brochure, although, most dimensions quoted have their origin in the imperial system. (See Glossary for individual metric terms and their imperial equivalents).

Forms, guides, and other documents containing more detailed information are available from Alberta Energy's web site at: www.energy.alberta.ca

Mineral Rights Ownership in Alberta

The mineral rights in approximately 81 percent of Alberta's 66 million hectares are owned by the provincial Crown and managed by Alberta Energy. Alberta Environment and Parks administer policies governing the management of water resources and renewable natural resources. The Alberta Energy Regulator (AER) is the single regulator in Alberta that regulates all aspects of resource development activities in the province, including petroleum and natural gas, oil sands and coal.

The remaining 19 percent of the mineral rights in the province are held by the federal Crown within national parks and Indian reserves, by the successors in title to the Hudson's Bay Company, by the national railway companies and by the descendants of original homesteaders through rights granted by the federal Crown prior to 1887. These rights are referred to in the legislation and in this document as "freehold rights."

Orderly development of the province's petroleum, natural gas and other mineral rights is essential to the viability of the non-renewable resource industries and the provincial economy. It is important that an acceptable return be realized, both by the people of Alberta and by the producers.

Alberta's petroleum and natural gas tenure legislation has evolved in response to the changing operating environment and requirements of the petroleum and natural gas industry and the government.

Present Petroleum and Natural Gas Tenure System

Acquisition of Petroleum and Natural Gas Agreements

Under section 16 of the *Mines and Minerals Act*, Alberta Energy is authorized to dispose of petroleum and natural gas leases and licences:

- on application, if the Minister considers the issuance of the agreement warranted in the circumstances;
- by way of sale by public tender conducted in a manner determined by the Minister; or
- pursuant to any other procedure determined by the Minister.

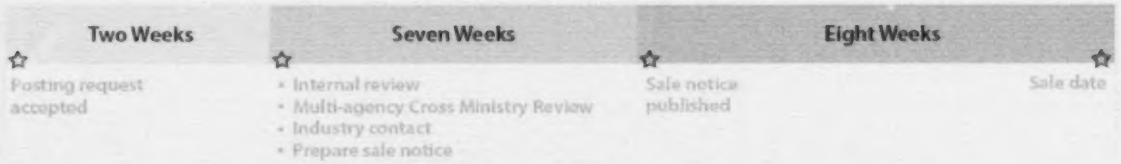
Sale by Public Tender

The majority of agreements are issued by public tender. Each year Alberta Energy holds an average of twenty-four sales (Public Offerings). The word "sale" is used by tradition, although it is a misnomer, since the Crown always retains title to its minerals. The rights are leased, not sold. The process is an auction in which companies or individuals submit bids and then a Petroleum and Natural Gas (PNG) agreement is issued to the highest bidder for each parcel.

Posting Request Cycle / Advance Booking

The normal posting cycle is 17 weeks, consisting of a two-week acceptance period, seven weeks for internal processing and eight weeks from the publication date of the Public Offering Notice to the sale date (See Figure 1). Sales are held at two-week intervals, and the dates of those sales, the publishing date and the corresponding acceptance periods are published by Information Letter two years in advance. Alberta Energy also accepts an advance booking for an agreement when the requester wishes to time the acquisition of the agreement to an evaluation well being drilled to a depth greater than 3,000 metres on lands adjoining the posting. For advance bookings, the Notice of Pending Public Offering is published a minimum of 16 weeks before the sale date. The posting will be published again in the Public Offering Notice eight weeks before the sale.

Figure 1
Example of posting cycle



Requesting Rights

Any company or individual who wishes to acquire PNG rights may submit a posting request electronically using the web-based Electronic Transfer System (ETS). Alberta Energy examines the requested rights to ensure that they are available and refers the request to the multi-agency Cross Ministry Review Committee. Their responsibility is to review surface access restrictions relating to the requested lands, and to provide Alberta Energy with full information on the nature of the restriction (for example, seasonal access restrictions for the protection of wildlife habitats). A description of the restriction and contact information, in the form of an addendum, will be attached to the rights when they are posted in the Public Offering Notice and will be recorded in the Notice to Lessee as an attachment to the agreement document upon issuance.

The maximum size for any posting is 15 sections in the Plains Region, 32 sections in the Northern Region, and 36 sections in the Foothills Region. The minimum size for a lease parcel is the spacing unit for an oil well (1/4 section or 64 hectares), except in the case where the Crown owns the petroleum and natural gas in only part of the spacing unit. For licences in the Plains Region, the minimum size is six full sections and for licences in the Northern or Foothills Regions, the minimum is one full section.

Configuration of Request

A posting request may be made for all the rights in a spacing unit, or for only a portion thereof. If all rights are available, a request may be made for:

- all rights;
- all rights from the surface to the base of a specified zone; or
- all rights below the base of a specified zone.

If there is an existing agreement in the spacing unit, so that not all of the rights are available, the following configurations are permitted:

- all available rights from the surface or the base of a specified zone to the top of the existing agreement; or
- all available rights from the base of the existing agreement to the basement or to the base of a specified zone.

The purpose of Figure 2 (below) is to demonstrate the maturity of the basin and the complexity of petroleum and natural gas (PNG) tenure today.

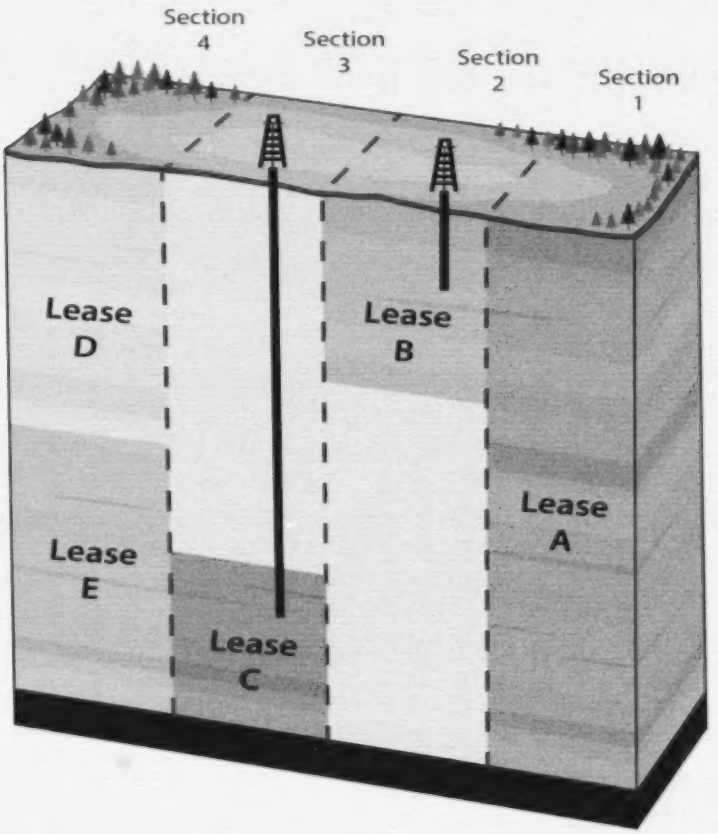
Lease A on section 1 may be a primary term PNG lease where all rights leased are still intact (from surface to basement). The agreement has not yet expired from its primary term when it would be determined if the agreement, or portions of the agreement may continue.

Lease B on section 2 may be a continued PNG lease where the productive shallow zones were allowed to continue. The deeper rights were severed from the agreement and reverted to the Crown. These deeper rights may then be reposted and sold at a public offering.

Lease C on section 3 may be a continued PNG lease where the productive deeper zones were allowed to continue. The shallow rights were severed from the agreement and reverted to the Crown. These shallow rights may then be reposted and sold at a public offering.

Leases D and E on section 4, illustrate shallow and deeper mineral rights under two separate agreements under the same section.

Figure 2
Rights are sold again and again



Public Offering Notice

Alberta Energy publishes a Public Offering Notice on its website at www.energy.alberta.ca eight weeks before the date of each sale. The Public Offering Notice has five components:

- A page specifying the date and bidding deadline of the sale, and instructions for submitting bids.
- A list of the parcels offered at that sale, describing the lands, substances and rights included in each one, as well as type of agreement (licence or lease).
- Appendix 1, which contains all of the Zone Designations (ZDs), referred to in the Notice.
- Appendix 2, which contains all of the Deeper Rights Reversion Zone Designations (DRRZDs), referred to in the Notice.
- Appendix 3, which contains all the addenda referred to in the Notice.

Submitting a Bid

A bid for a parcel is created and submitted electronically using Alberta Energy's web-based ETS. The sale closes at 12:00 noon on sale day. A bid may be submitted any time after the sale is published up to 12:00 noon of the sale day. ETS will not allow a bidder to submit, amend or withdraw a bid after that time. The total bid request for each parcel includes the $625.00 agreement issuance fee, the rental for the first year of the agreement at $3.50 per hectare, and a bonus amount. There is a standard minimum bonus bid of $2.50 per hectare for leases and $1.25 per hectare for licences. The form of payment accepted for winning bids is by electronic funds transfer (EFT). The bidder must be set up for EFT before creating and submitting a bid and have sufficient funds in their account at the time of the bid to cover all bids made.

Release of Sale Results

The sale results are usually published on Alberta Energy's website by 3:30 pm on the day of the sale. Clients may subscribe to Alberta Energy's email distribution list for notifications for when the sale results are posted on the website. The name of each successful lessee and the bonus amount paid for each parcel is included in the results; however, no information is provided on unsuccessful bids.

Sale by Direct Purchase

There are three types of direct purchases for portion, single substance and complementing rights as follows:

- Where the petroleum and natural gas rights in a spacing unit are part Crown and part freehold, with the Crown portion comprising less than 50 percent of the smallest applicable spacing unit, Alberta Energy allows the party who owns or holds an interest in the rights by virtue of a freehold lease, to acquire the Crown rights by direct purchase.
- Where an agreement contains the rights to a single substance (petroleum or natural gas) in a zone, the holder may acquire the rights to the other substance by direct purchase. The newly acquired rights are consolidated with the existing rights into a single agreement to prevent future separation.
- A designated representative or lessee of an active oil sands agreement can request a direct purchase of the associated natural gas rights for the available zones that match their oil sands rights.

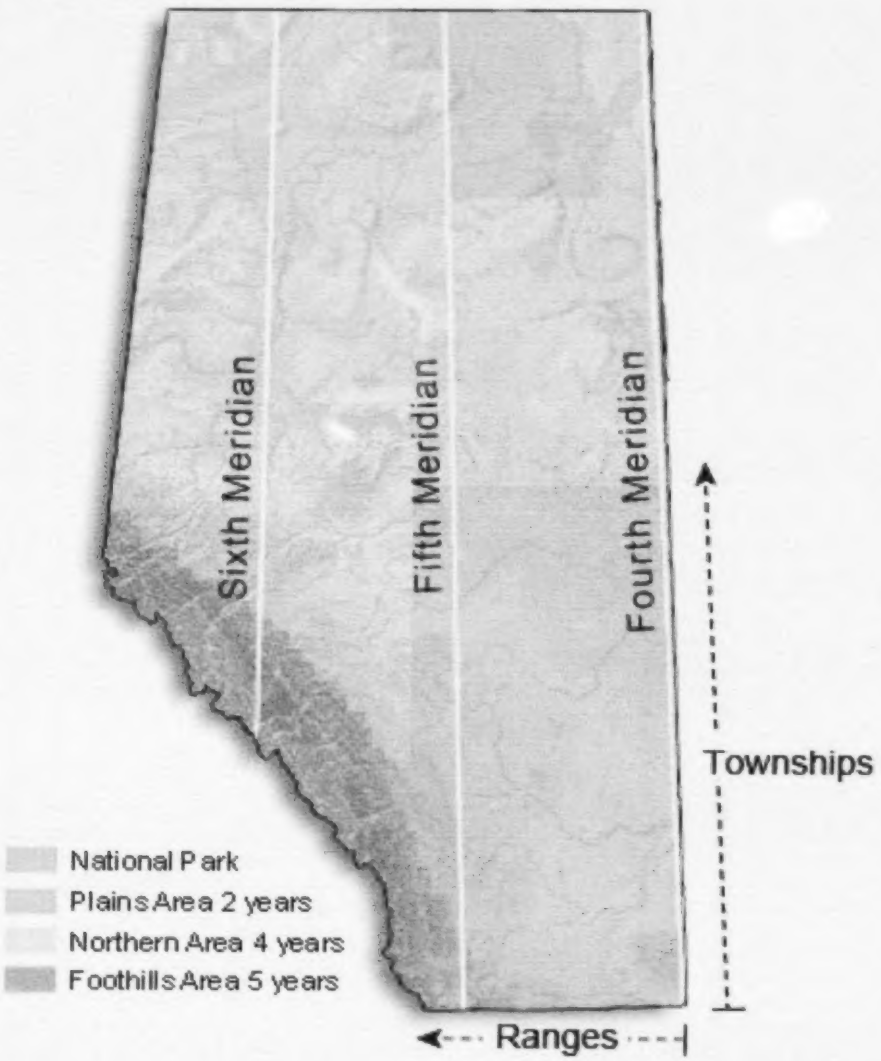
Petroleum and Natural Gas Agreements

Licence and lease continuation and validation is the process of fulfilling requirements to evaluate or prove productivity of petroleum and natural gas rights in order for industry to continue holding these rights. The continuation and validation of the agreements are administered under the Petroleum and Natural Gas Tenure Regulation.

Petroleum and Natural Gas Licence

Alberta Energy issues petroleum and natural gas licences for a term of two years when it is located in the Plains Region, four years in the Northern Region and five years in the Foothills Region (See Figure 3). These terms take into account the different geology, climatic conditions, and topography and access restrictions of the three Regions.

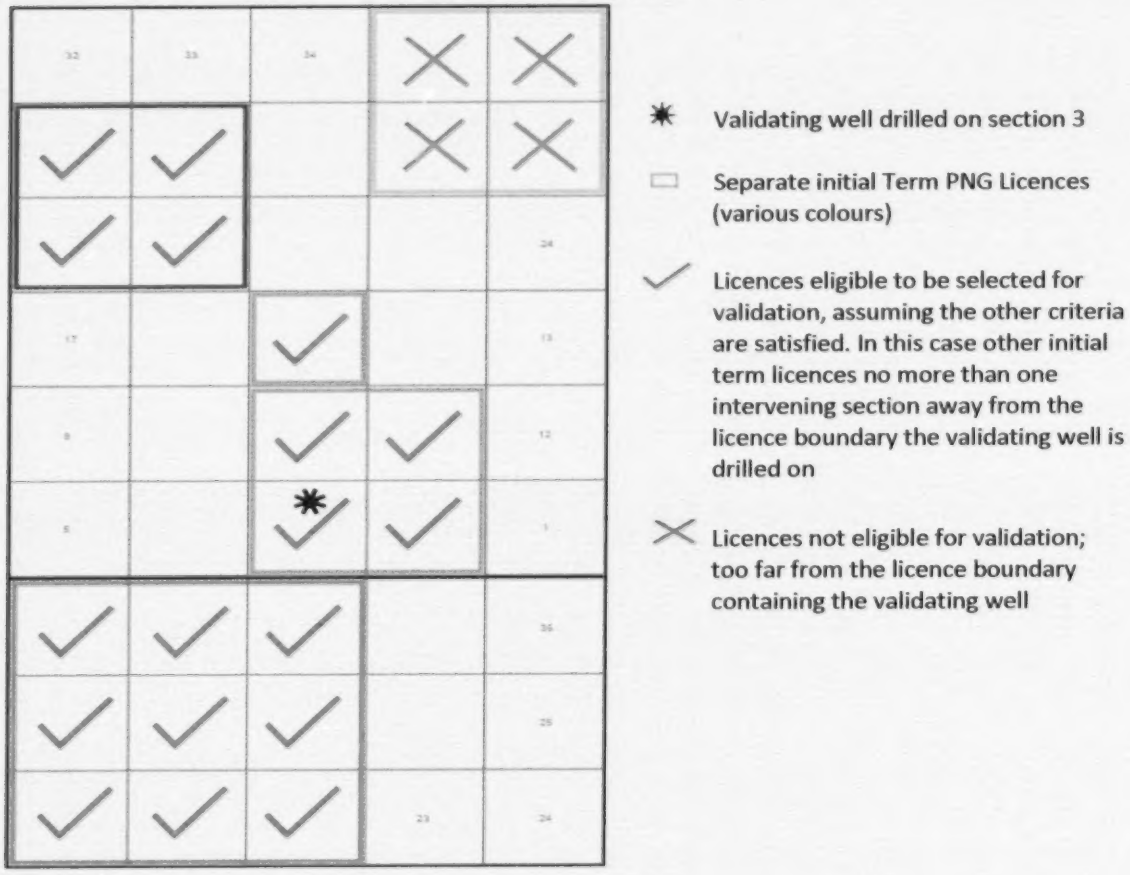
Figure 3
Map of regions in Alberta



A licence entitles the holder to drill for and recover petroleum and natural gas granted under the agreement. Each licence carries with it an obligation to evaluate the rights contained in the licence. This obligation can be satisfied by drilling on the location of the licence, or by selecting sections of land earned through the drilling of a well on another initial term licence within the specified distance criteria. Prior to March 2014, the selection of land earned by a well drilled on another initial term licence was referred to as "Grouping". Groupings no longer exist and have been replaced by "Unused Earned Sections".

Unused Earned Sections allow licensees to validate nearby licences, thereby reducing the need to drill unnecessary wells. A licence where lands are selected using Earned Sections, cannot be more than one intervening section from the licence where the validating well resides (see Figure 4).

Figure 4
Diagram of eligible area for earnings


Validating well drilled on section 3
Separate initial Term PNG Licences (various colours)
Licences eligible to be selected for validation, assuming the other criteria are satisfied. In this case other initial term licences no more than one intervening section away from the licence boundary the validating well is drilled on
Licences not eligible for validation; too far from the licence boundary containing the validating well

Once a well has been drilled either on the licence itself or if unused earned sections are used, the licensee may validate licence lands for an intermediate term of five years. The validating well must evaluate rights contained within the licence or in all of the licences using the unused earned sections. It

must be drilled for the purpose of evaluating petroleum or natural gas, but a dry and abandoned well will also qualify to validate the prescribed area. The validating well must also be drilled during the term of all the licences being validated.

A re-entered well may be used for earning and validating purposes provided it is drilled or whipstocked to at least the prescribed minimum depth of 75 logged metres beyond the total measured depth of the well prior to the re-entry. If minimum depth of 75 metres is not achieved, in either a re-entered or a newly drilled well, production or good hydrocarbon tests are required to validate the licence.

Wells that have been re-entered but not deepened may be considered as validating the spacing unit of the well down to the base of the deepest zone proven productive; however, no further sections are earned. When validating a licence with a horizontal well bore that goes through more than one licence, the eligible area in which to select sections earned may be increased.

When licences were introduced in July 1976, a well was required to be drilled in the location of the licence to qualify for validation entitlement. Alberta Energy still considers the best way to evaluate a licence is to drill a new well or re-enter an existing well bore within the location of the licence. There is, however, a provision to accommodate off-location wells in rare instances, primarily where the terrain was such that the drilling of an on-location well would cause serious damage to the environment. Approval from Alberta Energy must be obtained prior to spudding the off-location well for validating a licence.

The number of sections earned by a validating well is directly related to the depth of the well drilled as calculated by Schedule 2 of the Petroleum and Natural Gas Tenure Regulation. For example, a 1,500 metre well drilled on a Plains licence will validate six sections, while a 3,000 metre well on the same licence will validate 13 sections. For a multi legged well, only one leg can be used to calculate sections earned. This rule does not apply to re-entered validating wells where a zone is proven productive but no additional meterage is drilled; only the spacing unit for the well would be validated into the five year intermediate term.

All licences issued after December 31, 2001 are subject to deeper rights reversion below the deepest zone penetrated by the validating well, or below the deepest productive zone where productivity is occurring. Prior to December 31, 2001, validation allowed initial term licences to retain all rights as originally granted. Shallow Rights Reversion (SRR) does not apply to initial term licences.

A licence converts to a five year intermediate term when it is validated. The licence then carries the same obligations as a primary term petroleum and natural gas lease, where it must be either producing or proven productive in order to continue indefinitely.

Petroleum and Natural Gas Lease

The Crown introduced a five year petroleum and natural gas lease in 1976.

All leases grant the right to drill for and recover petroleum and natural gas from the rights granted in the agreement. When a lease reaches the end of its primary term, or a licence reaches the end of its intermediate term, it expires and is cancelled unless the holder can prove that it is producing or capable of producing petroleum and/or natural gas. Each spacing unit is assessed individually, so that an

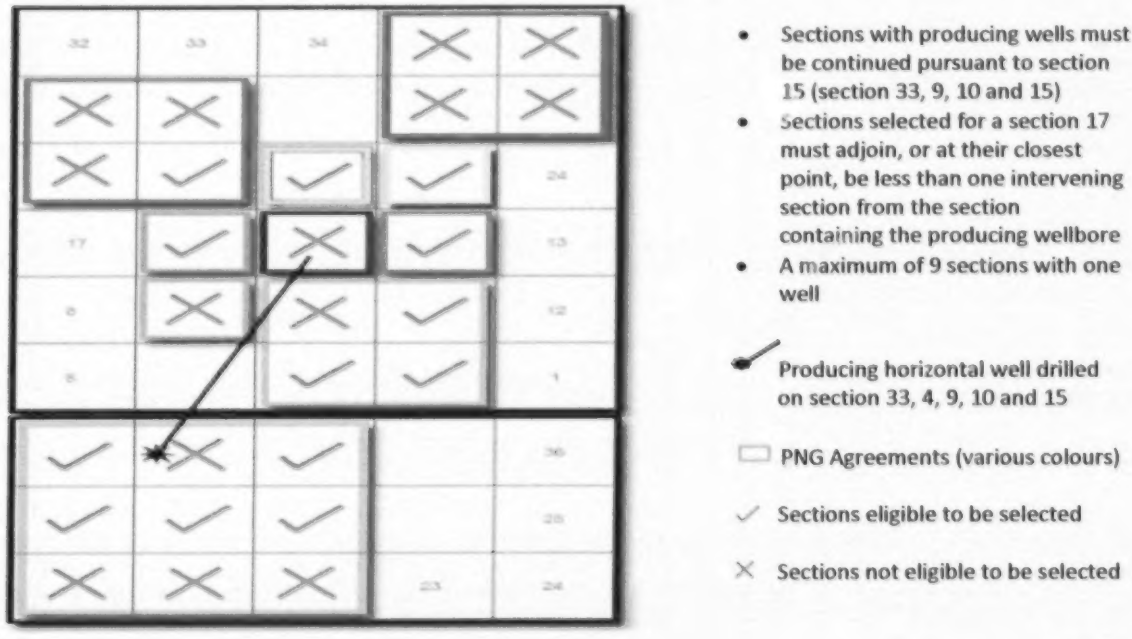
agreement may be cancelled, be continued in its entirety, or be continued with respect to a portion of its location. The requirements for continuation are set out in the Regulation. A spacing unit is eligible to be continued indefinitely under section 15 of the Regulation if:

- it contains a productive well;
- it is subject to a unit agreement;
- it is subject to an obligation to pay offset compensation;
- it is subject to a gas storage unit agreement; or
- it is considered to be productive, as demonstrated by geological mapping and other technical information.

Lands that are considered productive in one or more of these categories may be continued from the top of the shallowest productive zone, to the base of the deepest productive zone in each spacing unit. Alberta Energy implemented Shallow Rights Reversion (SRR) in 2009 for all agreements issued after that date. As a result of SRR, which is discussed in greater detail below, an agreement may be continued in one producing zone only. Lands and zones that are not producing, or that have not been proven productive, revert to the Crown.

A spacing unit may be granted limited continuation under section 17 of the Regulation if it is not proven productive but appears to Alberta Energy to be potentially productive. A maximum of nine sections may be granted a one year continuation under section 17 if the sections are adjacent to a producing, productive or potentially productive well. Horizontal wells may increase the selection area in which to select eligible sections because any sections that are adjacent to the sections that the well bore goes through are eligible to be selected – to a maximum of nine sections (see Figure 5).

Figure 5
Selecting sections using a horizontal well for a section 17


32
33
34
17
6
5
36
25
23
24
- Sections with producing wells must be continued pursuant to section 15 (section 33, 9, 10 and 15)
- Sections selected for a section 17 must adjoin, or at their closest point, be less than one intervening section from the section containing the producing wellbore
- A maximum of 9 sections with one well
Producing horizontal well drilled on section 33, 4, 9, 10 and 15
PNG Agreements (various colours)
Sections eligible to be selected
Sections not eligible to be selected

There is no longer a provision in the Regulation that allows for technical mapping to continue an agreement under section 17. Continuations under section 17 are not subject to SRR and the eligible sections are continued to the base of the potentially productive zone. An acceptance fee of $25.00 per hectare is required for continuation under this section.

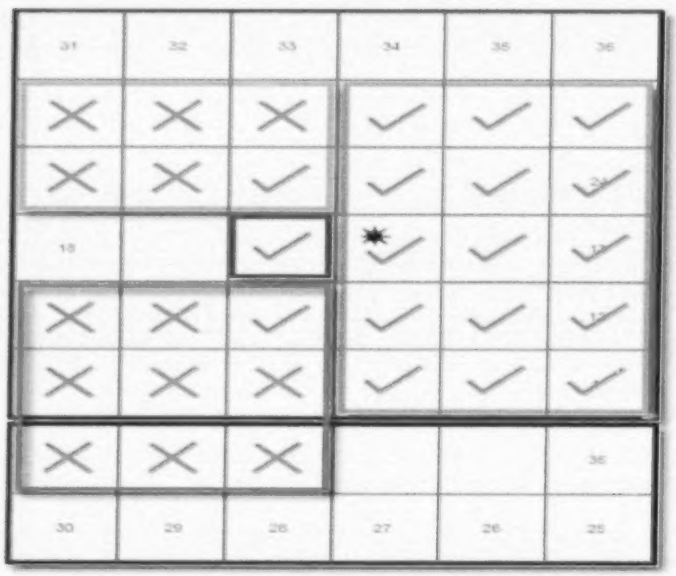
If, at the end of the one year section 17 continuation, the holder does not obtain continuation under another section within the Regulation, the rights expire and revert to the Crown.

A six- month continuation under section 16 of the Regulation is available when a qualifying well is drilled over agreement expiry, or is rig-released within the last three months of the term of the agreement. The drilling of subsequent qualifying wells on those lands will earn additional continuation terms of six months. There is no severance of deep or shallow rights during this short term continuation.

Up to nine sections within the qualifying area of one agreement may be continued on the basis of a single qualifying well. Up to nine sections within the qualifying area may be selected from more than one agreement, provided the nine sections being selected are less than one intervening section away from the section containing the qualifying well (See Figure 6). Horizontal wells may increase the qualifying area in which to select eligible sections that may be continued under section 16. All sections selected must contain some petroleum and/or natural gas rights that would be evaluated by the qualifying well. There is no provision in the Regulation that allows submission of technical data to continue an agreement under section 16.

All rights originally in the agreement continue during the section 16 continuation period. At expiry the agreement or rights may be continued under section 15, section 16 or be cancelled.

Figure 6
Selecting sections using a single qualifying well for a section 17



May select any section(s) from within the agreement the qualifying well is drilled on up to a maximum of nine. If nine are not selected, other sections within the qualifying area may be selected to bring the total to nine

✷ Qualifying well

Agreement boundaries

✓ Sections eligible to be selected

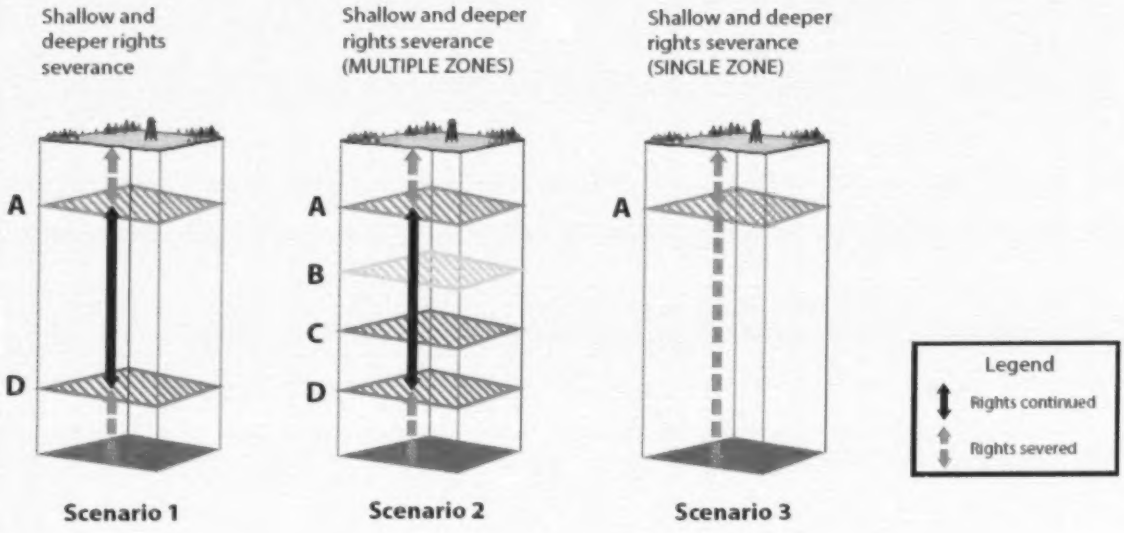
✗ Sections not eligible

Shallow Rights Reversion

SRR was announced in Alberta's New Royalty Framework in October 2007. The intent of SRR is to encourage production of resources from shallow geological formations and to assist in filling existing pipeline capacity by severing non-productive shallow rights and making them available for resale.

SRR refers to the severance of the petroleum and natural gas rights above the top of the shallowest productive zone in an agreement at continuation. SRR occurs in addition to the existing deeper rights reversion (DRR). Rights between the top of the shallowest productive zone and the base of the deepest productive zone will remain in the agreement after continuation. In some cases, this may result in zone-specific continuation where there is only one productive zone (See Figure 7). Agreements issued on or after January 1, 2009 are subject to shallow rights severance upon expiry of their 5 year term starting in 2014.

Figure 7



Scenario 1 shows SRR from surface to the top of Zone A and DRR from below the base of Zone D. There are no other productive zones. All rights between those two zones remain in the agreement.

Scenario 2 shows SRR from surface to the top of Zone A and DRR from below the base of Zone D. The productive zones within the agreement remain part of the agreement.

Scenario 3 shows SRR from surface to the top of Zone A and DRR from below the base of Zone A. This is a zone-specific continuation.

Severing shallow rights on any agreements issued prior to January 1, 2009 would require a three-year SRR notice to be served under Section 82 of the *Mines and Minerals Act*.

Monitoring for Continued Productivity

Once an agreement is continued pursuant to section 15, it remains continued indefinitely unless something occurs to cause its productivity to be questioned, the agreement rental is not paid or the agreement is surrendered. The abandonment of a well on or near the agreement, or the termination of a unit, may cause the agreement to be reviewed; knowledge within the area may expand with receipt of new information. There are a number of reasons that may cause an agreement to be reviewed including:

- internal reviews (area maps or other Tenure work);
- cancellation of a unit agreement;
- offset compensation no longer being paid; and;
- third party requests (another company with an interest in the area may feel that continuation is no longer warranted and requests Alberta Energy to conduct a review).

Alberta Energy may serve the Designated Representative with a one year notice of non-productivity under section 18 of the Regulation if continuation no longer appears substantiated. The Designated Representative or authorized company can submit an application demonstrating that the rights under notice are still productive, or they may not respond and allow the rights under notice to expire. The cancelled rights are then available for posting and future public offering.

Offset Requirements

When a well is placed on production, it is assumed that it will produce all of the petroleum or natural gas from its designated spacing unit first, and then begin to drain petroleum or natural gas from the adjoining spacing units. If this happens, the Rule of Capture in Alberta indicates that the owner of an adjacent spacing unit is not entitled to any share of the production or any relief from the operator of the well. To counteract this drainage, the adjacent owner's only recourse is to drill a well and drain the petroleum and natural gas from its rights before the offsetting well does.

When a producing well is drilled on freehold mineral rights (i.e. drilled on a spacing unit not owned by the Alberta Crown), royalties on petroleum and natural gas drainage of adjoining Crown spacing units will be paid to the owner of the freehold rights (because of the rule of capture) and ultimately result in a loss of revenue for the Crown and the people of Alberta. Therefore, the Crown must attempt to prevent, or obtain compensation for, the drainage (See Figure 8). Unlike industry, the Crown cannot drill a well. However, Alberta Energy may serve a notice on each adjoining disposed Crown spacing unit that does not already have a producing well from the freehold zone (except for PNG licences in their initial term). When a freehold well commences production of petroleum or natural gas, a notice is served to the Crown lessee requiring a well to be placed on production in the Crown spacing unit from the offset zone in order to offset the drainage by the freehold well. It is not necessary to produce the same substance as the notice (petroleum or natural gas). Several options are available for satisfying the offset notice.

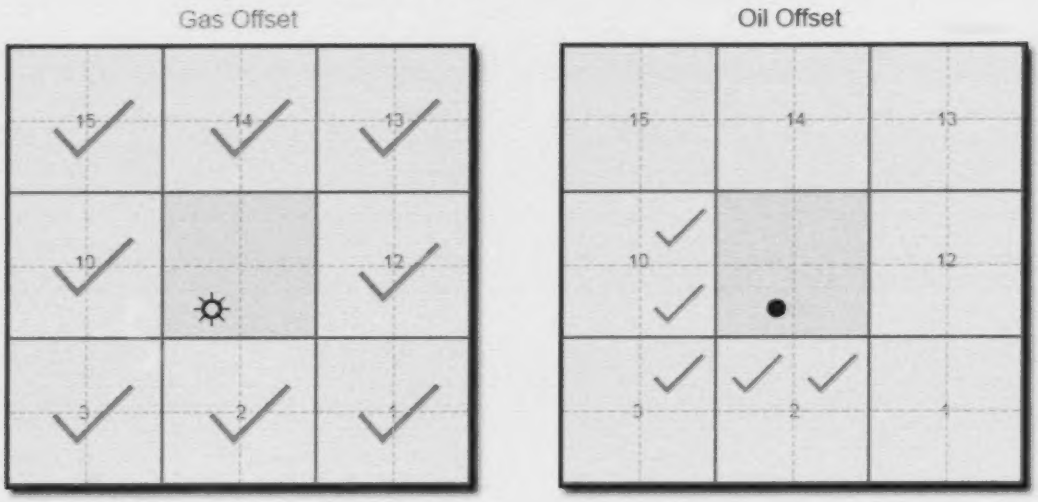
1. A lessee may provide data to prove that a well in the affected Crown spacing unit is producing from the same offset zone as the freehold well. Once production is demonstrated, the notice will be satisfied.

2. The lessee may defer the obligation to produce by electing to pay offset compensation. Under this option, the lessee pays the Crown 100 percent of the royalty payable as if the freehold well were located on the Crown spacing unit.
3. The lessee may elect to surrender the rights down to the base of the offset zone within the affected spacing unit, except for zones that are producing, unitized, subject to a gas storage unit agreement, or otherwise demonstrably capable of production. This option allows retention of the rights below the offset zone, as well as any productive zones.
4. An executed Production Allocation Unit Agreement will also satisfy an offset notice.

Failure to comply with the offset notice results in the cancellation of the affected Crown spacing unit down to the base of the offset zone.

If the Crown lessee can demonstrate to Alberta Energy's satisfaction that the freehold well is not draining Crown reserves, the notice is withdrawn.

Figure 8



✓ An offset notice can be served on any Crown lessee of an adjoining spacing unit.

Unitization

Parties who have working interests or royalty interests in petroleum and natural gas reservoirs may combine their agreements (except for PNG licence agreements in their initial term) into a unit and operate them as a single integrated entity. The purpose may be to achieve a more efficient and cost-effective operation, or to meet AER requirements for common ownership so that a secondary recovery scheme can be implemented. When the working interest owners have agreed to form a unit, one of them is designated as the unit operator. The operator facilitates and coordinates the negotiation of unit equity among the owners. The area within the unit is divided into tracts, and each tract is assigned a value, expressed as a percentage. This value is called the "tract participation factor." It may be based on

one or more of a number of technical parameters, such as hydrocarbon pore volume, remaining recoverable reserves or original oil in place.

The Crown administers three different types of unit agreements: Production Allocation Unit Agreements (PAUA's), Gas Storage Unit Agreements and Unit Agreements, which all have their own individual purpose and requirements. Since the Crown participates in units as a mineral rights (royalty) owner it only becomes involved in units that contain Crown leased mineral rights. Alberta Energy reviews the unit area for productivity and evaluates the tract participation factors to ensure that they are fair and reasonable for all parties. The unit agreement becomes effective and binding on all parties when it has been executed by the working interest owners and royalty owners. Each working interest owner contributes to the unit costs in proportion to their tract participation factor and receives production or revenues in the same proportion, whether or not there is a well physically located on their PNG agreement. Royalty owners also receive revenue in proportion to their tract participation factors, but do not pay any costs. Of the wells already existing within the unit area, only those necessary for the efficient production of the resource will be operated, and any unnecessary wells will be shut in or abandoned. If additional wells are required, they will be drilled by the unit operator on behalf of the unit, and the costs shared among the working interest owners. When the unit reaches the end of its purpose, it is terminated by the unit operator and the agreements contained in it become subject, once again, to current non-unit land tenure requirements for productivity. If the unit operator does not terminate an inactive unit, the Crown has the ability to withdraw from the unit by issuing to the unit operator a notice of withdrawal. Once the unit is terminated, the Crown can subsequently serve a one-year notice of non-productivity on the leased agreements. If the agreement or rights revert back to the Crown they become available for re-acquisition.

Trespass

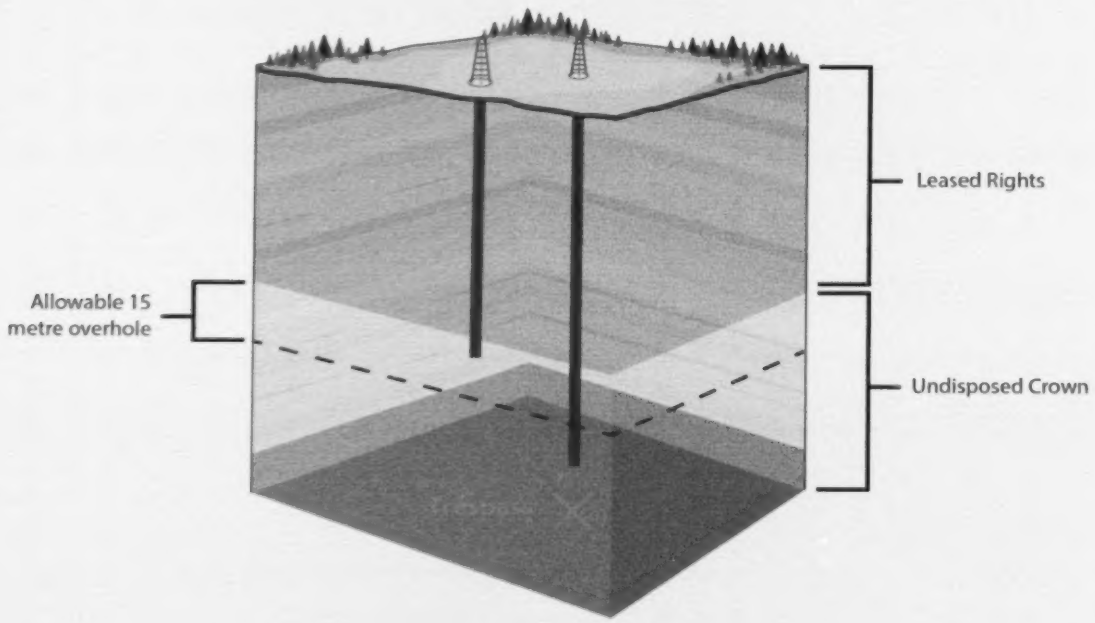
Trespass is a contravention of section 54(1) of the *Mines and Minerals Act*, which states: "No person shall win, work or recover a mineral that is the property of the Crown in right of Alberta unless the person is authorized to do so under this *Act* or by an agreement." Alberta Energy views trespass against Crown undisposed minerals to be a serious offence. By trespassing on Crown undisposed minerals, a company can directly gain an unfair benefit from the wrongful recovery of minerals that belong to the people of Alberta or can gain an unfair advantage by obtaining information that deprives Albertans of the speculative value of Crown minerals.

Alberta Energy monitors any unauthorized activities within Crown undisposed minerals such as activity from mineral rights that have expired and have been severed from an agreement and also rights within road allowances, which have been conducted without prior authorization. Undisposed Crown rights are minerals owned by the Crown without a tenant. If a company does not hold a valid agreement to the mineral rights owned by the Crown, they cannot drill, core, test, terminate in or produce from those rights.

A company is allowed to drill through undisposed Crown rights to get to their leased minerals, and they can log or take rock samples as required by the AER. Some activities can be undertaken in undisposed Crown rights in specific situations authorized by Alberta Energy or the AER.

Alberta Energy introduced a pecuniary penalty of $50,000.00 per occurrence of trespass on or after September 1, 2004 in undisposed Crown petroleum, natural gas and oil sands rights. In addition to the trespass penalty, a company may be directed to pay compensation to the Crown for the value of the minerals obtained during the trespass.

Figure 9
Example of trespass overhole



Once a trespass has been determined, a company is required to immediately cease all activities in trespass and submit all data acquired in trespass to the AER for public release and to provide Alberta Energy with a Statutory Declaration that this has been done. The company is also required to review their business practices and inform Alberta Energy what changes have been put in place to prevent a re-occurrence.

If a trespass has occurred on mineral rights that are posted in a Public Offering Notice, Alberta Energy may withdraw the parcel from the land sale until such time as they are satisfied that the AER has released all data acquired in trespass into the public records. This protects the integrity of the land sale by ensuring all industry clients have had sufficient opportunity to review the trespass data. Any parcels successfully acquired at the land sale may be cancelled if it has been determined that the data acquired in trespass was not publicly available prior to the land sale.

Agreement Administration

Transfers of Ownership

During the life of a Crown mineral agreement, registered ownership can change due to acquisition and divestiture activities that occur in industry. When ownership changes, upon receipt of a transfer document, the new registered interest is recorded in Alberta Energy's records. This ensures the most current ownership is in place for proper collection of Crown royalties, and provides up-to-date information to industry.

Alberta Energy accepts transfers of the entire, or a portion of the agreement but not for stratigraphic mineral rights. Transfers of registered interest in Crown petroleum and natural gas, oil sands, coal and other mineral agreements must be submitted electronically through Alberta Energy's ETS. This allows clients to create and approve transfers of registered interest online and to retrieve the Memorandum of Registration once the transfer has been registered by the Crown.

Encumbrances

Alberta Energy registers Builders' Liens against Crown mineral agreements pursuant to the *Builder's Lien Act*. If legal action is commenced in relation to the lien, a Certificate of Lis Pendens is filed against the same agreement. Financial institutions or individuals may also register a security notice against a Crown agreement when it is used as collateral or for a debt owed.

Well Administration and Undisposed Rights

Well Administration reviews all well licences issued by the AER to confirm the corresponding mineral rights are leased under an agreement for the targeted well. This ensures that well licences are not issued for undisposed Crown rights. Errors are reported to the AER Audit group for further action, including possible cancellation of the well licence. Well Administration then links wells to all applicable agreements based on the corresponding mineral rights described on the well licence.

Producing wells are also reviewed and coded to ensure the Alberta Crown collects their appropriate percentage of royalty; to determine if the producing well falls within a designated unitized zone (if applicable) and to ensure the minerals are not undisposed, which may result in trespass.

When agreement rights are amended or cancelled, Well Administration reviews agreements to ensure any active wells are addressed for abandonment through the AER. The well licensee has the option to either abandon the well, link the well to another active agreement on the location, or repost the rights for a future sale. If they are unsuccessful in acquiring the mineral rights, the well must ultimately be abandoned.

Well Administration also reviews, rejects, or approves applications for the use of undisposed Crown rights for actions such as: injection/disposal, observation, water sourcing, the use of the minerals under Crown road allowances, and the re-entry of vested Crown wells. When an agreement is cancelled, any well in the cancelled location vests to the Crown free and clear of all interests, charges and liens.

Carbon Capture and Storage Tenure

In 2008 the Alberta government released the Climate Change Strategy which included the implementation of Carbon Capture and Storage (CCS). CCS is the process of capturing carbon dioxide

(CO_2) from large industrial sources before it is released to the atmosphere, and then safely transporting the CO_2 and permanently storing it in mature oil and gas reservoirs or in other deep geological formations.

In 2010 the *Mines and Minerals Act* was amended by adding the following:

- Section 15.1(1)(b) that indicates pore space below the surface of all lands in Alberta is vested in and is the property of the Crown in right of Alberta.
- Part 9 for Sequestration of Captured Carbon Dioxide that enables the issuance of CCS agreements.

In 2011, the Carbon Sequestration Tenure Regulation was passed that allows the issuance and administration of a CCS agreement for pore space deeper than 1000 meters.

A Carbon Sequestration Evaluation Permit (permit) grants, in accordance with the terms and conditions of the permit, the right to conduct evaluations and testing, including the drilling of wells and injection of substances into deep subsurface reservoirs within the location of the permit to evaluate the geological or geophysical properties of the deep subsurface reservoirs for the purposes of determining their suitability for use for the sequestration of captured CO_2. The term of a permit is for five years and cannot be renewed. A permit does not grant the permittee the right to win, work or recover any minerals found within the location of the permit.

A Carbon Sequestration lease grants, in accordance with the terms and conditions of the lease, the right to drill wells, conduct evaluation and testing and inject captured CO_2 into deep subsurface reservoirs within the location of the lease. The term of a lease is for 15 years and may be renewed for a further 15 years. A lease does not grant the lessee the right to win, work or recover any minerals found within the location of the lease.

Automation of Services: E-Tenure

Alberta Energy is committed to meeting the evolving business needs of industry clients. Since 2001, Alberta Energy began developing electronic tenure (e-Tenure) initiatives. The Tenure Industry Advisory Committee (TIAC) remains active and is the primary vehicle to discuss business changes. Whenever possible, Alberta Energy has moved towards automation.

Initial E-Tenure Initiatives:

Initiatives	Implementation Date	Results
E-Transfers	March 2004	Electronic creation, submission and approval of agreement transfer forms.
E-Postings	March 2005	Electronic submission of posting requests for public sale of PNG and oil sands mineral rights and application of direct purchases where applicable.
E-Bidding	May 2006	First electronic land sale on June 28, 2006 replaced the manual submission of bid letters.

In 2009, Tenure initiated a Business Process Review (BPR) of Continuations business processes. The objectives were to develop efficiencies in petroleum and natural gas continuations processes, decrease administrative complexity for industry and Alberta Energy and increase continuation automation. A BPR committee was established to conduct the review, with representatives from industry associations, the Alberta Energy Regulator and Alberta Energy.

Resulting from several BPR processes, subsequent e-Tenure initiatives were implemented.

Initiatives	Implementation date	Results
E-Crown Mineral Authorization	November 2013	Replaced paper submissions of applications. Industry clients can retrieve final documents sent from Tenure via ETS.
E-Offset	October 2014	Replaced paper communication with electronic transactions and documents. Industry clients can track their submissions on line.
E-Continuation	February 2015	Replaced paper submissions of agreement continuation and validation applications. Industry clients can retrieve and respond to documents sent from Tenure via ETS.

Past Petroleum and Natural Gas Tenure Systems (1931-1975)

Between 1670 and 1869, the mineral rights in the area that is now Manitoba, Saskatchewan, Alberta and the Northwest Territories were owned by the Hudson's Bay Company. In 1869, the Company surrendered most of its land to the Dominion of Canada, retaining 18,000 hectares in settlements and trading posts.

In exchange, it was granted five percent of the land surveyed in the fertile belt (about 961,600 hectares in Alberta), including the mineral rights for those lands.

Until 1930, the Crown mineral rights in Alberta were controlled by the Government of Canada and administered by the federal Department of the Interior. On October 30, 1930, those rights were transferred to the Province of Alberta. At first the *Administration of Natural Resources (Temporary) Act* continued the statutes and regulations of the Government of Canada pertaining to the natural resources in the province. Alberta's Department of Lands and Mines administered this Act until June 18, 1931, when the *Provincial Lands Act* and associated regulations came into force. These regulations were almost identical to the former federal regulations. The *Mines and Minerals Act* came into effect on April 1, 1949, and applied to all Alberta Crown petroleum and natural gas rights formerly governed by the *Provincial Lands Act*. Simultaneously, the Alberta Department of Lands and Mines was split into the Department of Mines and Minerals, responsible for the administration of non-renewable resources, and the Department of Lands and Forests with similar responsibilities for renewable resources.

Agreements

Prospecting Permits/Petroleum and Natural Gas Leases

In 1931, the regulations governing permits to prospect for petroleum and natural gas and the Petroleum and Natural Gas Regulations under the *Provincial Lands Act* were announced. Prospecting permits (the term "prospecting" was used to denote exploration as it is known today) were granted by the Department of Lands and Mines for one year on a maximum area of 768 hectares. The permit holder was required to conduct core drilling on the permit area to earn the entire area in lease. Petroleum and natural gas leases with a 21-year term were granted to a maximum of 768 hectares and were renewable for a further 21 years if they were capable of producing petroleum or natural gas in commercial quantities.

Once a lease was granted, a lessee was required to have machinery and equipment suitable for carrying on drilling operations on site within one year, and to begin drilling within 15 months. The regulations allowed the grouping of leases for operating purposes so that activities such as drilling could be concentrated on one or more of the grouped leases rather than be simultaneously conducted on all. The maximum area that could be included in a group was 8,000 hectares. Rentals, established in 1920 at the rate of $1.25/hectare for the first year and $2.50/hectare for subsequent years, did not change.

By 1936, there were great advancements in geological knowledge and geophysical techniques for locating potential oil and gas-bearing geological structures. It became apparent that prospecting permit areas were too small for the scale of exploration required. The regulations governing the issuance of prospecting permits were amended to allow the permit size to be at the discretion of the Department. The maximum size of lease groupings was also increased from 8,000 to 20,000 hectares. In addition, the lessee could use drilling expenses as a credit towards satisfying the lease rentals up to and including the 12th year of the lease.

New Petroleum and Natural Gas Lease Regulations governing the disposition of petroleum and natural gas rights were established in 1941, increasing the area obtainable under lease from 768 to 3,840 hectares.

Petroleum and Natural Gas Reservations

Prospecting permits were discontinued in 1937 and replaced by a new form of disposition called the petroleum and natural gas reservation. Up to 40,000 hectares (156 sections) could be included in a reservation, allowing exploration over large areas where little was known about the geology and the potential for hydrocarbons.

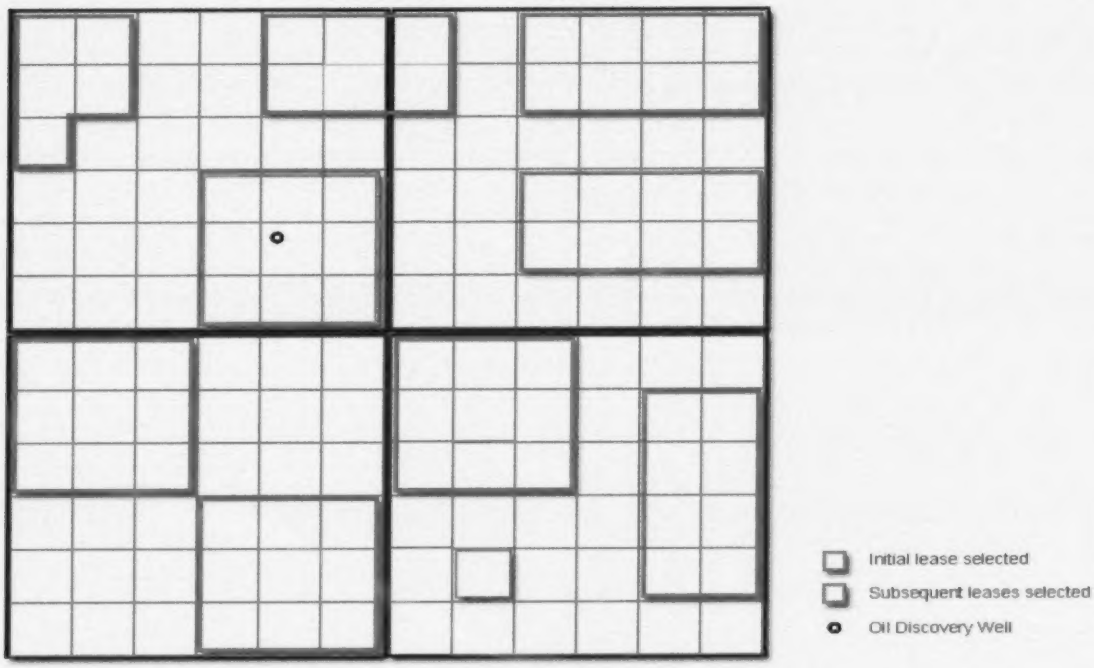
A reservation was acquired by competitive bid. The area available was advertised by a notice posted in the Mining Recorder's Office, and a sale date was specified. Interested parties submitted sealed bids, and the reservation was awarded to the highest bidder. If no bid was received, the reservation became available the following day for a minimum-filing fee on a first come, first served basis.

Loosely specified work requirements were imposed on the reservation holder, to ensure that an exploration effort was maintained throughout the life of the reservation.

The principle of grouping was carried over from the prospecting permit, and reservations could be grouped to a maximum of 80,000 hectares (312 sections).

Completion of the work program entitled the reservation holder to select 50 percent of the reservation area in lease blocks. Each block could be no larger than a nine-section square (4.8 km by 4.8 km) or an eight-section rectangle (3.2 km by 6.4 km), and the leases had to be in a checker board pattern or separated by corridor acreage at least 1.6 km (one section) wide. In the event of a commercial oil discovery, the reservation holder was obligated to make a lease selection around the discovery within three months, and an equal area surrounding the lease reverted to the Crown, while the balance of the reservation continued in effect (See Figure 10).

Figure 10



The corridor acreage was designated Crown reserve, and it reverted to the Crown at the expiry of the reservation. Its purpose was to ensure that a company discovering a hydrocarbon pool would be forced to return part of the pool to the Crown, to be subsequently made available to industry for further development. In combination with the market pro-rationing system, it was thereby possible to ensure that those participating in the development, after the initial exploration phase, could be assured of a market. Although it created a complex leasing system, it provided a highly competitive situation for companies of all sizes.

Petroleum and natural gas reservations remained in effect until December 1982, when the last reservation was cancelled.

Provincial Reserves

In 1941 Alberta Energy identified 15 areas throughout the province where a high degree of control was desirable in the disposition of mineral rights, and enacted legislation withdrawing those areas from disposition under the normal lease and reservation regulations. These areas became known as Provincial Reserves.

In 1944, new regulations were enacted governing the disposition of these Provincial Reserves. One hundred percent of the area within them was declared to be Crown reserve, as opposed to the 50 percent in the balance of the province. Petroleum and natural gas reservations were disposed at quarterly Crown reserve sales, but Alberta Energy reserved the right to reject bids, and filing the following day was not permitted. These reservations were also subject to 50 percent surrender at the time of lease selection.

Natural Gas Licences and Leases

Although the search for hydrocarbons to this time was primarily directed at crude oil, increasing amounts of natural gas were being discovered. At the same time, major limitations were recognized in the lease block and corridor approach to gas pool development. Most of the gas pools being discovered were inaccessible to market and were thus uneconomic to develop, particularly at the prevailing gas prices.

The natural gas licence was therefore introduced in 1951. Upon discovery of natural gas, this mechanism allowed the holder of a petroleum and natural gas reservation to earn up to 100 percent of the natural gas rights underlying his reservation.

The area selected for a natural gas licence had to be contiguous (all lands in actual contact and no corridors or space left between selected lands). The lease block and Crown reserve corridor requirements were waived, but the maximum size of the licence could not exceed 36 sections. The initial term of the natural gas licence was six months, renewable for five six-month periods. A continuous drilling program was required, with the first well spud within three months of the issuance of the licence and each subsequent well drilled within three months of the previous one.

Licences were zone-specific. The licence zone was designated by reference to a log of the discovery well. If further drilling discovered natural gas in paying quantities in a zone other than that contained in the licence, the discovered zone could be included in the original licence.

The natural gas lease, introduced in 1952, allowed holders of natural gas licences to earn 21-year natural gas leases after the continuous drilling program. The natural gas lease was confined to the zone(s) proven capable of producing natural gas in paying quantity. There was no set requirement for lease configuration, but only complete gas spacing units could be selected.

Petroleum and natural gas reservation holders who earned natural gas licences were required to surrender the gas-bearing zones from the reservation to include them in the natural gas leases granted following the licence. At the expiry of the reservation, the holder was permitted to select petroleum and natural gas leases devoid of the natural gas, in accordance with the normal leasing procedures for petroleum and natural gas. The result, on a typical reservation, was the selection of petroleum and

natural gas leases, forming the typical lease block and corridor pattern, with natural gas leases superimposed upon both the lease and the intervening corridor.

Crown Reserve Natural Gas Licences

By 1952, it had become apparent that certain areas of the province had greater potential for natural gas production than for crude oil. There was a need to stimulate long-range exploration for natural gas that was considered marginally economical. It was therefore decided to make the natural gas rights within Crown reserves in these gas-prone areas available on a competitive bid basis. The new form of agreement was known as a Crown reserve natural gas licence, and it granted natural gas rights in all zones.

The tenure conditions for the Crown reserve natural gas licence were identical to those for the normal natural gas licence selected from reservations. The maximum licence size was 36 sections and term was 21 years. Generally, the licensee had to begin drilling within six months of the licence date. Holders of these licences could acquire 21-year natural gas leases based on the number and depth of productive gas wells drilled into the licence.

Crown Reserve Drilling Reservations

Crown reserve drilling reservations were introduced in 1954 to stimulate drilling to specific target zones believed to have good prospects for crude oil. Crown reserve rights were made available for public tender at industry's request, with the requester also specifying the zone to be evaluated by drilling to earn leases. This focused the attention of all prospective bidders on specific geological plays; the rights were advertised in a sale notice that specified the number of sections that could be earned as lease after drilling to the zone, and the reservation was awarded to the highest bidder.

The size of the Crown reserve drilling reservation, and the number of sections that could be selected as lease, increased with the depth of the prospective zone. If natural gas was encountered, the natural gas licence option allowing 100 percent lease coverage of the gas-bearing zone(s) to a maximum of 36 sections was available, provided that the reservation's target zone was reached.

The reservation holder was required to begin drilling within one year of the reservation date, and to continue drilling until the presence of oil in paying quantity was discovered, with intervals of not more than three months between the abandonment of one well and commencement of the next. If the target zone was penetrated, 25 percent of the drilling reservation area could be converted to a petroleum and natural gas lease. This form of drilling reservation could be renewed every six months, for a maximum of three years, from the date of issuance. The entire cost of drilling performed on the drilling reservation could be applied as a dollar credit towards the first year's rentals on the leases earned.

Petroleum and Natural Gas Permits

In 1962 it was recognized that the focus of exploration activity was moving into the central basin area in pursuit of deeper multi-zone prospects, and as a result activity was declining in the south and east portion of the province. To maintain interest in the latter area, Block A was created, comprising Townships 1 to 64 between the fourth and fifth meridians. The Crown reserve concept was eliminated in Block A, and a new form of disposition was created: the petroleum and natural gas permit. The most significant characteristic of this type of agreement was 100 percent lease ability for petroleum and

natural gas upon completion of drilling a well to a zone that could be considered prospective for hydrocarbons. Petroleum and natural gas permits could be acquired in the same way as petroleum and natural gas reservations: there was no minimum bid requirement, and parcels for which no bid was received could be acquired by filing the day after the sale.

Significant Historical Events (1970-1975)

During the first half of the 1970s, a number of significant international, national and provincial events took place that had repercussions on the provinces petroleum and natural gas tenure system. These events included:

1970: Middle Eastern countries, which produced most of the word's crude oil, expressed their desire for greater participation in oil company operations in their countries.

1971: Canadian exploration by the major companies shifted from Alberta to the northern frontier. The Alberta government recognized the need to stimulate oil and gas activity in Alberta.

1972: Public hearings on methods of stimulating activity levels were held with the petroleum industry. The Alberta government recognized the need for greater accessibility to oil and gas rights by the active smaller companies and thus began a review of the entire mineral rights tenure system. The government also introduced an exploratory drilling incentive system to encourage the search for new oil and gas reserves.

1973: The Organization of Petroleum Exporting Countries (OPEC) implemented major increases in crude oil prices. The Alberta government increased royalties on crude oil, and the petroleum industry's preoccupation with pricing and royalty matters resulted in suspension of its discussions with the Alberta government on the oil and gas rights tenure system.

1974: The Alberta Petroleum Marketing Commission (APMC) was established to supersede price control by a small number of major multi-national companies. Further Crown royalty increases occurred and changes to federal income tax legislation ended the deduction of provincial royalties in calculating federal tax.

1975: The geophysical incentive system was introduced to sustain a desired level of geophysical activity.

Transition to the Present Tenure System

1976-1984

By the mid-seventies a number of concerns about the existing tenure system had been identified, and Alberta Energy held formal and informal discussions with interested industry associations and individuals.

One of the most important issues was the stagnation in the exploration of deeper geological zones. Some operators were holding large lease blocks by production from shallow zones. Many smaller independent oil and gas companies felt that this was delaying the development of, or even sterilizing, the deeper zones, and the Department shared their concern. Other issues included:

- The need to stimulate drilling activity.
- The decreasing possibility of discovering new oil pools that would exceed the areal extent of a lease block.
- The need to rationalize and reduce the number of types of agreements being issued (petroleum and natural gas reservations, permits and leases, natural gas licences and leases, Crown reserve natural gas licences and Crown reserve drilling reservations were all still in effect).

In 1976, the Government of Alberta passed amendments to the *Mines and Minerals Act*, with the following features:

- Two new forms of agreement were introduced - the petroleum and natural gas licence, which had a term of two, four or five years depending on its location in the province, and the five-year petroleum and natural gas lease.
- The licence was intended to operate as a short-term exploratory agreement, and the lease as a longer-term development agreement. Both could be acquired by public tender.
- There was a minimum size requirement and restrictions for licences regarding location. For example, a licence could only be posted in an area where there was no established production.
- Licence lands could be "earned" by drilling and subsequently converted to lease. Lease earning was based on the depth of the well drilled.
- Two licences could be grouped for the drilling of a single well, and the lands earned could be shared between the two licences at expiry.
- The licence was converted to a lease for a period of five years.
- Rental waivers were used to encourage early drilling on licences. They remained in effect for licences issued before January 1, 1998 but did not apply to any licences issued after that date.
- A lease could be continued beyond its primary term if the lessee could demonstrate that it was capable of producing petroleum or natural gas in paying quantity at expiry. However, the rights below the deepest productive zone in the lease would revert to the Crown, as would any lands that were considered to be non-productive. This new principle was aimed at freeing up the deeper rights that were sterilized by the former practice of continuing all rights in a spacing unit, regardless of which zone was productive.
- All leases issued on and after July 1, 1976 were subject to deeper rights reversion, and the first deeper rights continuation occurred in 1981. The application of deeper rights reversion to existing 10 and 21-year leases was delayed until January 1, 1983 or the expiry date of the lease, whichever occurred later. This delay was intended to give the lessees of those agreements time to explore the rights below existing productive horizons.
- Except in those instances where the ownership of a spacing unit was part freehold and part Crown, the acquisition of undisposed Crown petroleum and natural gas rights could be accomplished only through public tender.
- Petroleum and natural gas rights would be offered for public tender only if requested by industry.
- Petroleum and natural gas permits, petroleum and natural gas reservations, Crown reserve natural gas licences and Crown reserve drilling reservations were no longer issued. Those in force before 1976 were allowed to continue in effect until their terms expired or the agreement holders requested cancellation.

1985-1994

In 1985, the *Mines and Minerals Act* was once again revised. Alberta Energy's intent was to simplify part 4 (then part 5) of the *Act*, dealing with lease continuation, and to carry the principle of deeper rights reversion a step further into its final form. The most significant amendments were:

- The responsibility for identifying a productive lease and applying for continuation was shifted from Alberta Energy to the lessee. Alberta Energy hoped that this would discourage the practice of simply submitting rent for an expiring lease, and encourage lessees to apply for continuation, identifying the productive lands and zones.
- The provisions that allowed for the continuation of a single section containing a well that had drilled through expiry could now continue all of the lands being evaluated by the well, and the time frames were expanded so that a well that finished drilling within the last 90 days of the term would also qualify the lease for continuation.
- Notices of non-productivity were amended from six-month duration to one year.
- The final stage of deeper rights reversion was implemented. The 1976 legislation had provided for continuation of all the productive lands in a lease to the deepest productive zone anywhere in the lease. This meant that an entire lease could be continued to the base of a deeper zone, even though only one spacing unit in it was productive from that zone, the others being productive from shallower zones. A notice of non-productivity was then served on the remaining unproven rights to complete the reversion six months later. Amendments were introduced that allowed each spacing unit within a lease to be continued independently, immediately freeing up all of the unproven rights.

A further legislative change was enacted on July 12, 1990, when the annual rental rate for virtually all mineral agreements was set at $3.50 per hectare. Rental rates had previously varied, according to the type of agreement, from $0.25 to $2.50 per hectare.

1995-1997

By 1995 a new list of issues had accumulated, some emanating from industry and some from Alberta Energy. From Alberta Energy's perspective, the most pressing was the dramatic increase in the number of leases that had been issued in the early and mid-nineties that would begin to expire in 1998, approximately double the number that had been the norm for the previous few years. Existing automated systems were already outdated, and would certainly not be adequate for the increased workload.

In addition, the Government of Alberta introduced legislation requiring the revision of all existing regulations, with a view to eliminating those that were unnecessary, and simplifying the remainder.

Alberta Energy reviewed the petroleum and natural gas tenure legislation, regulations, policies and business rules, and involved the oil and gas industry in the review process. It established the Tenure Industry Advisory Committee (TIAC), consisting of representatives from the major industry associations. Over the course of the following two years amendments were made to the *Mines and Minerals Act,* the associated regulations and business processes. This culminated in the Petroleum and Natural Gas Tenure Regulation, the Mines and Minerals Administration Regulation, the Crown Minerals Registration

Regulation and the complementary amendments to the *Mines and Minerals Act*, all of which became effective on January 1, 1998.

1998-2006

In fall of 1995, Alberta Energy made a commitment to the industry associations to monitor the effectiveness of the tenure system on an ongoing basis. As a result, in June 1998 the Department met with the Tenure Industry Advisory Committee to consider some additional changes.

In January 1999, Alberta Energy proposed amendments to petroleum and natural gas licence groupings, offsets, section 16 continuations and offset compensation. The low response from industry, and a lack of industry consensus on licence administration, prompted a Round Table discussion in June 1999. The results were used to finalize the amendments to the Petroleum and Natural Gas Tenure Regulation, which took effect on January 26, 2000. Highlights included:

- Allowing licence groupings from a maximum of two to an unlimited number, subject to some areal and timing restrictions.
- Implementing the severing of deeper rights for all licences issued after December 31, 2001.
- Permitting the application for continuation under Section 16 of the PNG Tenure Regulation for up to five sections without the submission of technical data, provided certain areal restrictions are met.
- Applying the offset provisions to Crown spacing units that corner the spacing units for a producing freehold well.

In spring 2003, the *Energy Statutes Amendment Act* introduced several changes to the *Mines and Minerals Act*. Included in the changes was a provision that authorized regulations for the levying of a pecuniary penalty when someone explores for or produces Crown minerals without authority. This particular section was proclaimed in force effective March 17, 2004.

Effective September 1, 2004 amendments were made to three tenure regulations after extensive consultation with industry stakeholders. Highlights include:

- Introduction of a $50,000.00 trespass penalty for each occurrence of trespass against undisposed Crown petroleum and natural gas rights.
- Introduction of provisions to ensure a smooth transition into the emerging electronic business environment.
- Changes to the fee and penalty provisions within the regulations to properly characterize which charges are fees and which are penalties, including amending fees to achieve cost recovery.
- Amendments to the offset provisions to more accurately reflect the changing nature of the oil and gas business.

Effective July 1, 2006, Alberta Energy implemented a mandatory monthly statement process. This affected the invoicing of industry clients for rent on PNG agreements and other mineral agreements as well as for land searches. The change streamlined the invoicing process by consolidating all charges onto one monthly invoice and eliminated the need to enter into a contract to use the monthly statement process.

Role of the Alberta Energy Regulator in Oil and Gas Management

The Alberta Energy Regulator (AER), formerly the Alberta Energy Resources Conservation Board, was created from the Government of Alberta-led Regulatory Enhancement Project. This project aimed to ensure that Alberta's resource policy development, public consultations, and regulation of energy development were efficient and competitive while effectively supporting public safety, environmental management, and resource conservation objectives – all while respecting the rights of landowners.

From this process the government drafted the *Responsible Energy Development Act*, which was passed in December 2012. Under this act, the new regulator operates at arm's length from the Government of Alberta.

This evolution continued in 2013 when the AER became a new organization and began taking on regulatory functions related to energy development that were previously managed by Alberta Environment and Parks. Today the AER is the single regulator of energy development – from application and exploration, to construction and development, to abandonment, reclamation and remediation.

To ensure that the activities are safe, environmentally responsible, and closely managed, the Government of Alberta has granted the AER authority to:

- review and make decisions on proposed energy development,
- oversee all aspects of energy resources activities in accordance with government policies,
- regularly inspect energy activities to ensure that all applicable requirements are met,
- penalize companies that fail to comply with AER requirements, and
- hold hearings on proposed energy developments.

The AER's authority includes – for energy-related development only – the *Environmental Protection and Enhancement Act*, including reclamation and remediation activities, and the *Water Act*. The AER is also responsible for public lands and geophysical activities under the *Public Lands Act* and the *Mines and Minerals Act*.

While Alberta Energy issues petroleum and natural gas lease and licences, granting the right to drill for and recover oil and gas, the physical operations relating to drilling and production, on both Crown and freehold minerals, are regulated by the AER.

The AER issues licences to drill wells and determines the spacing of wells being drilled into individual reservoirs to ensure efficient drainage of the resource. It regulates production rates to prevent reservoir damage, and may compel operators to implement secondary recovery schemes for the same reason. Companies are required to submit the well information obtained to the AER, making it available to the public, sometimes after a period of confidentiality. This information includes drilling, testing and completion records, drill core and cuttings, fluid analyses, flow rates and pressure, logs and monthly production quantities, but does not include geophysical data. The AER also compiles and publishes aggregated information such as reservoir characteristics, performance and remaining reserves.

In addition, the AER is responsible for creating Zone Designations (ZD) and Deeper Rights Reversion Zone Designations (DRRZD) at the request of Alberta Energy. The AER may also be called upon to

resolve differences of opinion in the interpretation of these designations, particularly in areas that are geologically complex.

Glossary

Acre - an imperial unit of area, 43,560 square feet. There are 160 acres in a quarter section and 640 acres in a section. Mineral agreement areas are recorded in hectares.

Continuation - refers to the system in place for allowing lessees to retain the productive rights in their agreements past the expiry date. An expiring agreement is reviewed in accordance with the provisions of the Petroleum and Natural Gas Tenure Regulation and is continued indefinitely with respect to the lands and zones that have been proved to be productive (section 15). Other forms of temporary continuation are available for agreements that are only potentially productive (section 17), or on which a drilling program is being conducted at expiry (section 16).

Deeper Rights Reversion - refers to the principle that unproven deeper zones are returned to the Crown at the expiry of an agreement, as well as unproven lands.

Deeper Rights Reversion Zone Designation (DRRZD) - identifies a zone by its name. As noted in AER Decision 95-10, historically, the name of the zone identified within type wells takes precedence over the depths identified in terms of utilizing a DRRZD. DRRZDs are used primarily for deeper rights reversion, but can also be used for other purposes, such as offsets. These are also used to describe shallow rights reversion. See also Zone Designation.

Freehold rights - mineral rights not owned by the Crown in right of Alberta. These mineral rights may be owned by corporations, individuals or by the Crown in right of Canada.

Freehold well - a well that is drilled into freehold rights.

Gas storage unit agreement - an agreement that establishes a reservoir as one in which natural gas may be stored for commercial use after it was produced from its native reservoir.

Grouping - an arrangement that allows petroleum and natural gas licences to share the validation entitlement of a single well. Groupings were discontinued in 2014.

Hectare - a metric unit of area – 10,000 square metres. The *Mines and Minerals Act* deems a section to be 256 hectares and 2.5 hectares in an acre. For the purpose of mineral leasing, a section, quarter-section and a legal subdivision are deemed to contain 256, 64 and 16 hectares respectively.

Hydrogen sulphide - a flammable, colourless gas, commonly known as sour gas or H_2S and has an odour of rotten eggs. It is corrosive and poisonous and, if allowed to escape into the atmosphere, is potentially lethal to humans and animals. Great care must therefore be taken when drilling into a reservoir know to contain hydrogen sulphide.

Information Letters and Bulletins - publications issued periodically by Alberta Energy to advise industry clients of changes in policy and pricing, to communicate proposed changes to legislation and business rules, and to solicit feedback to proposals.

Initial term - the first period of a licence term, beginning with the term commencement date and continuing for two years for a Plains licence, four years for a Northern licence and five years for a Foothills licence.

Intermediate term – upon validation of an initial term licence, this second period of a licence term, follows the expiry of the initial term and continues for five years, regardless of the region the licence is located.

Lessee - defined in the *Mines and Minerals Act* as the holder according to the records of Alberta Energy of an agreement. The term lessees may therefore refer to holders of leases or licences or both, depending on the context in which it is used.

Location - defined in the Petroleum and Natural Gas Tenure Regulation as being the surface area of an agreement and the zones and rights contained within that particular agreement.

Mapping - geological mapping such as net pay, hydrocarbon pore volume and structure maps, supported by cross-sections and any other data that establishes the areal extent of a pool.

Mineral rights – subsurface rights in a parcel of land leased by Alberta Energy or privately held subsurface rights owned by an individual(s) or company(s).

Minimum depth - the required depth a well must be drilled in order to validate a licence for the purpose of conversion to Intermediate Term. "Minimum depth" is defined in the Petroleum and Natural Gas Tenure Regulation as: (i) 75 metres of measured depth, or (ii) a lesser measured depth approved by the Minister under section 9(3).

Notice of non-productivity - a one-year notice issued pursuant to section 18 of the Petroleum and Natural Gas Tenure Regulation, advising a lessee that all or part of an agreement is no longer considered productive. The recipient may respond to the notice and provide evidence that demonstrates that the agreement is still productive, or may allow the lands and/or rights to expire.

Offset compensation - compensation that is payable to the Crown by a lessee whose agreement is offset by a producing freehold well and has been served an offset notice. The lessee is required to put a well on production to offset the potential drainage by the freehold well, but may elect to defer the drilling of that well by paying offset compensation to the Crown.

Offset zone - according to the context in which it is used, may mean either the zone from which a freehold well is producing or the corresponding zone in the adjoining Crown spacing unit.

Paying quantity - this term has been used in the Alberta tenure legislation and regulations for many years, but has never been legally defined as it is different for each formation and reservoir. By policy it is determined by Alberta Energy on a case-by-case basis, with a number of factors such as production, tests, reserves, logs and mapping of wells on and near the lease taken into account.

Permittee – defined in the Carbon Sequestration Tenure Regulation as the holder of an evaluation permit.

Potentially productive - used to refer to a well, a zone or a spacing unit that cannot be demonstrated at the required level of proof to be productive, but displays indications that it might be productive if further work were conducted.

Primary term - the initial period of a lease term, beginning with the term commencement date and continuing for five years.

Production Allocation Unit Agreement - an agreement formed to allow working interest owners and royalty owners to share in the production from a single well drilled through two spacing units of Crown and freehold interest.

Producing well - a well that is physically producing oil or gas, according to the records of the AER and any other information available to the Minister.

Productive - used to refer to a well, a zone or a spacing unit that has been proved to be capable of producing petroleum or natural gas in paying quantity via technical data, whether or not it is physically producing.

Public tender - the method used by Alberta Energy for conducting sales of oil and gas rights. The sale is a public auction in which companies or individuals submit bids and then an agreement is issued to the highest bidder for each parcel of mineral rights.

Rental waivers - a system whereby the drilling of a well on an agreement issued prior to January 1, 1998 would entitle the holder of that agreement to a waiver of future rental payments.

Rig release date - the date on which, according to the records of the AER all drilling, logging and testing operations on a well have been completed and the rig is released from its contract.

Royalty interest - an ownership interest in mineral rights.

Royalty owner - an individual or corporation who owns a royalty interest. A royalty owner who leases out his rights to a working interest owner is usually entitled to a share of the production obtained from the rights.

Rule of capture - common law principle stating that the production obtained through a well belongs to the person from whose rights the well is producing. If the well drains all of the oil or gas from beneath that property and begins to drain from an adjacent property, the owner of that adjacent property is not entitled to any share of the production, or to any relief from the operator of the well.

Sale - process by which industry acquires the mineral right to drill for, and recover minerals, owned by the Crown. Sales are a competitive bid auction held every two weeks where the highest bidder is awarded the agreement.

Section - an area of one square mile comprising 640 acres and approximately 256 hectares. The size of a section may deviate from the standard area, but for the purpose of leasing mineral rights it is deemed to contain 256 hectares.

Secondary recovery scheme - a scheme approved by the AER for enhancing the performance of a reservoir. Fluids such as gas or water are injected into the formation to restore formation pressure and fluid flow, thereby extending the productive life of the pool.

Shallow rights reversion - Refers to the principle that unproven petroleum and natural gas rights above the top of the shallowest productive zone in an agreement will be severed from the agreement at continuation.

Spacing unit - the area allocated by the AER for the purpose of drilling for and producing oil or gas. The standard spacing units are one section for gas and a quarter-section for oil, but these may be amended on application to the AER if an operator can demonstrate that the optimum drainage radius for a specific zone and substance in a given area is smaller or larger than the standard.

Spud – drilling commencement of a well.

Tenure - term used to describe the system whereby mineral rights are managed by Alberta Energy and disposed to individuals and companies as agreements.

Township - a term used in the "Alberta Township System". Depending on the context in which it is used, it refers either to a six square mile area comprising 36 sections, or to a row of townships spanning from east to west across Alberta. Township 1 lies at the southernmost boundary of Alberta, and Township 126 lies at the northernmost boundary.

Undisposed - used to refer to Crown mineral rights that are not subject to an agreement and may therefore be available for acquisition. The *Mines and Minerals Act* prohibits unauthorized operations on undisposed Crown rights, although geophysical activity is permitted.

Unit Agreement - an agreement among the working interest owners and royalty owners in an oil or gas pool for the co-operative operation of the pool. Also includes Production Allocation Unit Agreement, which is a small unit containing a single well.

Unit operator - the party designated by a unit agreement as the operator of the unit.

Unitized - used to refer to a zone or a spacing unit that is subject to a unit agreement.

Working interest - a right to produce and dispose of minerals in an agreement, associated with the responsibility for the costs of production and disposal. A working interest is usually acquired from the royalty owner of the mineral rights through a leasing arrangement.

Working interest owner - an individual or corporation who owns a working interest.

Zone - defined in the Petroleum and Natural Gas Tenure Regulation as a stratum or series of strata considered by the Minister to be a zone for the purposes of this Regulation. In many cases zones may be geological formations or members, but in some instances they are larger (geological groups) and include more than one formation (the Mannville zone, for instance, includes numerous formations).

Zone Designation - a zone designation (ZD) designates a litho-stratigraphic zone described specifically by the depths identified in a particular well. ZDs are used, for instance, to describe the zones included in natural gas leases. When a ZD is being used, the depths and the interval take precedence over the name given to the zone. See also Deeper Rights Reversion Zone Designation.

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